Modelling a sustainable urban management system

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MODELLING A SUSTAINABLE URBAN MANAGEMENT SYSTEM

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Summary

After developing a methodological framework to model actions taken collectively and individually by the project group, we first established an inventory of research approaches. We then expanded our approach to professionals and future residents of an urban renewal neighbourhood in Aix-les-Bains. This methodology, while originating from the strategic analysis suggested by Crozier and Friedberg, should find new applications that complement the approach adopted for quantitative-qualitative comparative analysis.

1. Initial situation of the existing approaches

Our 'Habitat' can play a decisive role in the emergence of new forms of cooperation making it possible to reconcile in day to day life preservation of the environment, economic efficiency and social equality. The significance of these concerns falls completely within the framework of urban renewal operations to release certain areas from their decline, or even their complete exclusion from the development of our societies. 751 neighbourhoods are involved, classified as critical urban areas (zones urbaines sensibles, ZUS). The expectations of planners and the needs of public bodies have multiplied in the last few years, so a systematic methodological framework is proposed based on evaluation tools adapted to the context of each urban project.

1.1 The PASTILLE European project

Cofinanced within the 5th RDFP (Research and Development Framework Programme) by the European Commission and the Swiss government, the objective of the PASTILLE project (Promoting Action for Sustainability Through Indicators at the Local Level in Europe) was to develop an indicator base to assist public bodies to adjust their decisions, taking into account the criteria for sustainable development. The need to evaluate the policies applied involves public officials directly and leads to new forms of administration known as "New Public Management". These approaches notably reinforce the need to formulate precise objectives, evaluate the progress achieved, impose sanctions if necessary or at least corrective measures, etc.

Experiments carried out within the PASTILLE project has shown that using checklists of indicators overshadows the definition of a local policy that supports sustainable development, and therefore the priorities pointed up locally. The approach we habitually find to the indicators means they cannot be perceived as "endogenous elements of the dynamics of public action, in a particular context". On the contrary, the PASTILLE consortium1 suggests the indicators be used as strategic tools for the governance process. Shared as the chief device for a perpetual forum between the different participants in urban governance, the indicators can create more cross-functionality, enabling better negotiation of often conflicting strategies and visions...

[1] http://www.lse.ac.uk/collections/pastille/test.xls

1.2 The European measure HQE2R

Under the coordination of the Centre Scientifique et Technique du Bâtiment (CSTB, Scientific and Technical Building Centre),the European project for research and demonstration known as " HQE2R"[2] (Sustainable Renovation of Buildings for Sustainable Neighbourhoods) has between 2001 and 2004 brought together ten research organisations or centres and thirteen towns belonging to seven European countries. The HQE2R project has established as objectives the proposal of some tools, methods and guides containing recommendations or good practice for urban planning or renewal operations.

Three evaluation models have been developed by the members of the HQE2R project for evaluating urban projects: the ENVI model (Committee on the Environment, Public Health and Consumer Policy) on the environmental impact of projects or scenarios, the INDI model (INDicator based sustainability Impact assessment) for project evaluation and selection, the ASCOT simulation model (Assessment of Sustainable Construction and Technologies cost) that enables the comparison of a sustainable building with a benchmark building in terms of overall cost. These tools make it possible to meet respond to the requirements of European Directive 2001/42/CE pertaining to the environmental evaluation of programmes and plans.

1.3 The ADEQUA project

The purpose of the ADEQUA method[3] is to create a tool to help in decision making during the rehabilitation of a residential quarter. The project consisted first of all of a classification of the criteria for sustainable development then secondly an inventory of the methods for their evaluation. The method was then validated using case studies chosen in partnership with the authorities.

A final quantification of the indicators associated with the objectives enables construction professionals, the planner or the authority to evaluate quantitatively and to compare different planning alternatives for an area, with the aid of spidergrams. This quantification is based on the use of simulation tools and multi-criteria aggregation.

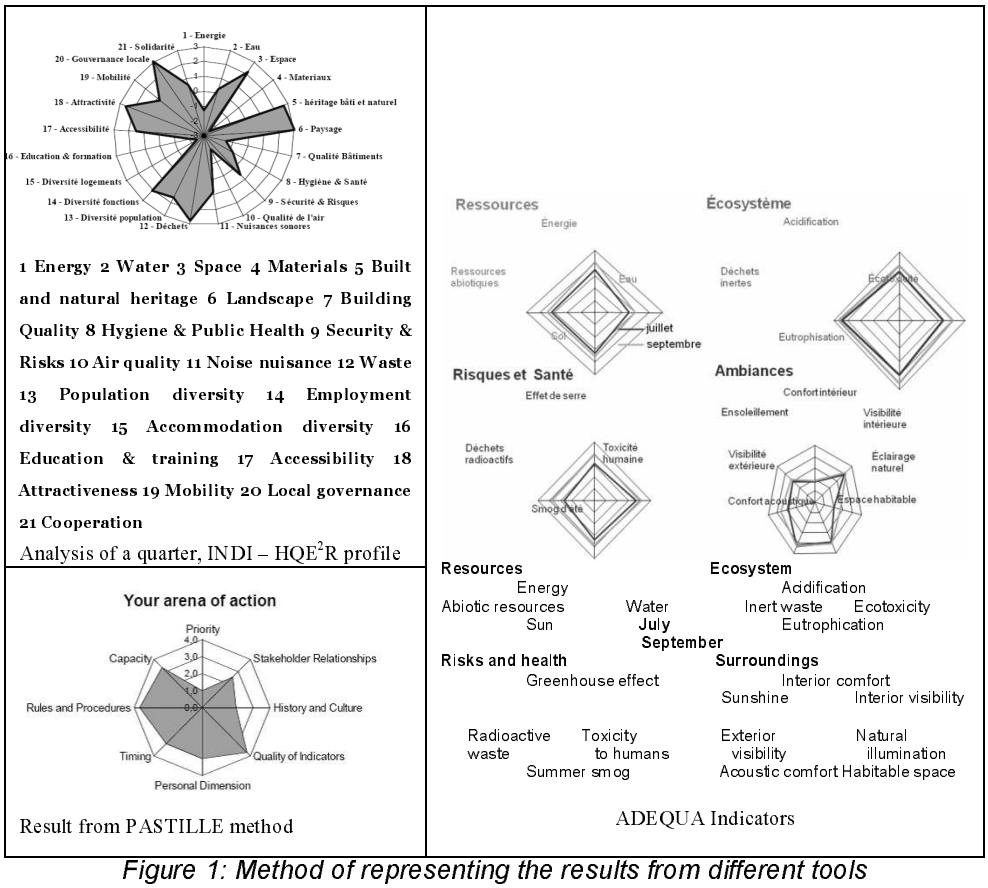

Figure 1: Method of representing the results from different tools

[2] http://hqe2r.cstb.fr

[3] Frédéric CHERQUI, Méthodologie d'évaluation d'un projet d'aménagement durable d'un quartier – méthode ADEQUA, Laboratoire d'Étude des Phénomènes de Transfert Appliqué au Bâtiment, Université de La Rochelle, 2006.

2 A new Eco Obs approach to sustainable urban management

2.1 Concept

The research presented below clearly emphasizes the importance of developing in an often conflictive context the strategic tools to aid the public authority in their decisions or their negotiations. Here the concern is to examine, in a context of urban complexity[4], sustainable urban planning projects as a mode of organisation of the actions and the participants. Elsewhere we have observed, in the context of the ADEQUA project, the difficulties encountered in evaluating different urban project scenarios. This approach does not sufficiently respect habitual practices and the resources available to the participants. So it does not suffice on its own to favour the inclusion of sustainable development issues at this scale.

The methodology that we are currently developing aims at detecting objectively the convergences or "cooperation sets" and divergences or "conflict sets" between the participants in the urban planning operation. The project group, as a sociological system, exists because of the interdependence of the participants and actions, whose objectives may converge or diverge. Different strategies are analysed with the aim of encouraging the necessary collective actions for the success of the operation. The authority can then organise the conduct of the project in accordance with the supposed blockage points inherent to the participants. Our approach represents each participant in the environmental management of an operation. The tool which has been developed on this methodological basis makes it possible to create various sociograms representing the direct influences on the participants and the impact of each participant on the objectives of an operation. It is important to develop, in an often conflictive context, tools that assist the public authority in its decisions or its negotiations.

2.2 The use of MACTOR

In order to be able represent our results visually, we have had recourse initially to the MACTOR application. This illuminates the sets of alliances and potential conflicts between the actors and makes it possible to enquire about the possibilities of change in the relations between the different participants. So at first sight it is a suitable tool for the type of study desired, and for these reasons it has been used[5] on the Mérigotte mixed development zone (ZAC, zone d'aménagement concerté) and the Aix les Bains project today.

Analysis of the sets of participants is a crucial stage for the construction of a basis for reflection that then makes possible the construction of scenarios: without this precise analysis, the scenarios lack relevance and coherence, and very often analysis of the interplay of participants is preceded by a structural analysis to identify the key variables.

So the objective of using the MACTOR method is to provide to a participant an aid to decision making for establishing their policy on alliances and conflicts.

2.3 Creation of a new tool for observing eco-districts

The tool previously described and the use of MACTOR has made possible a real advance in the domain of sustainable urban management. However, the method of collecting data took a long time: all the participants had to be interviewed separately and the data then had to be captured to proceed with the analysis.

Now it is desired to attempt to set up an IT platform on which some questionnaires would be placed online, completed remotely and collected via the internet.

The approach adopted for the creation of the new tool breaks down into five stages. The first is the choice of IT system that best responds to our expectations. The second is the creation of 2 questionnaires aimed at users and professionals as well as a working framework to filter the data from the planning project's environmental chart. The third is collection of the responses. The fourth is the processing the data, with the establishment of sociograms (using MACTOR mathematical formulas) and statistical elements. The fifth and last stage is accumulation, interpretation and the creation of a database.

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[4] Marie FAUCONNET, Projet urbain et gestion durable de la Ville, in A DA CUNHA, P KNOEPFEL, JP LERESCHE, S NAHRATH, « Enjeux du développement Durable », PPPUR, 2005

[5] A preliminary set of results has notably been presented in ACHARD G, BUHE C, DUFRASNES E, WURTZ E, "*Environmental performance and management of sustainable urban projects*", IISBE, UNEP, CIB, Lisbon, 2007

3 Application to the Sierroz / Franklin district in Aix-les-Bains

The Urban Renewal of the Sierroz / Franklin Roosevelt district in the town of Aix-les-Bains is a project with the aim of transforming the area by opening it up to the rest of the town. Specifically, this is achieved by:

- dismantling 300 dwellings (4 x 14 floor towers)
- creating environmental quality (HQE® or similar approach)
- 311 dwellings in small collective homes
- shops
- premises for services
- the rehabilitation and residentialisation of 422 residences (creating defensible and 'owned' space, and/or installing security devices)
- reorganising the road network.

This project, extending over the period 2006-2012, falls very definitely into sustainable development practice. So protection of the environment, one of the components of sustainable development along with the economic and the social, must be exemplary. Like for the follow-up in the Mérigotte mixed development zone, we started by identifying several initial participants and objectives :

- The public authority and services associated with the Town of Aix les Bains;
- The town planner at Passagers des Villes architectural office

Each participant chosen has been identified based on a non-directive interview so that they can specify their goals and objectives, their strengths, their weaknesses. A single questionnaire enables us to grasp the position of each participant on the same basis. Just as we have established with MACTOR, we have been able to esta hows how closely the participants adhere to their obje

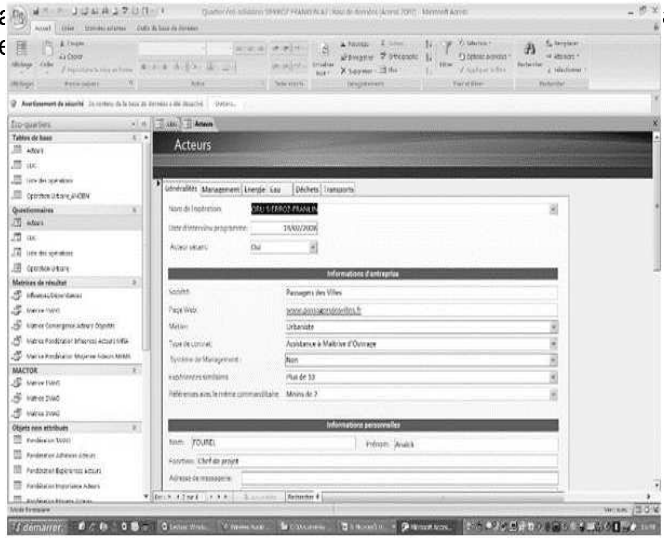

Figure 2: Eco-districts database

Figure 3: histogram of adherence of the participants to goals

4. Conclusions and prospects

Considering the significant number of urban rehabilitation operations sustained by ANRU (National Urban Renewal Agency), the ambitions of these programmes and the importance of the associated issue of urban sustainability, the need for evaluation and feedback is intensified and should intensify still more in the near future.

Our approach proposes to respond to this by making available, via a unit monitoring the energy efficiency integration practices in these "ANRU operations", a systematic framework based on evaluation tools adapted to the context of each urban project. So our work positions us at the intersection of these expectations in order to :

- Evaluate the practices applied to respond to the challenges of urban sustainability,
- Support exchanges between those running projects agreed by ANRU,
- Set up a monitoring centre based on the operational evaluation tools.

This monitoring centre will therefore monitor three types of indicators:

- Indicators of financial and economic incentive practices
- Indicators of performance or results
- Process or management indicators

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